INTRO FROM
ANDY PERRY
GROUP CERAMIC PROCESSES LEADER


Much has happened at Lucideon since our previous edition, from an influx of talented people and new materials research to planned investments in a ceramics pilot plant facility.

The expertise of our new and existing people is being put to good use on a multitude of innovative projects for industry, including:

- Development of a non-cementitious composite building product
- Slow and delayed release pesticides
- Innovative processes and ceramics for water filtration
- Dental ceramic material development
- Nuclear waste immobilization by flash sintering
- Ceramic processing additives

Our investment in a new ceramics pilot plant / line facility and our plan to host the National Advanced Sintering Centre are both progressing as expected; details of both of these are inside.

We’ve been doing a lot of work in support of the Ceramic Sector Deal bid which, if successful, would see us relocate to the proposed Ceramic Park in Stoke-on-Trent, UK. You can find out more about this on page 3.

One exciting development is that we’ve launched a materials app, containing lots of information about ceramics, from a faults guide to latest news and events. Read more on page 3.

The R&D work that we do in the Advanced Materials & Processes department is based on your challenges, so please do let us know what they are. Whether you want to optimize existing products or processes, or develop new ones, or are interested in introducing a disruptive technology into your business, we can help.

And if you would like to visit our UK or US facilities, then please give me a call.

We look forward to hearing from you.
**INNOVATE UK PROJECT**

Sodium batteries are a key technology to potentially replace current lithium-ion technology, with the world’s lithium resource in limited supply, and expected to become exhausted between 2025 and 2040.

This project will assess how Flash Sintering (FS) can be used to manufacture beta-alumina solid electrolytes, a critical component of sodium batteries.

This step change in ceramic processing would revolutionize sodium battery design by enabling lower temperature operation, reducing costs and improving safety and market acceptability for electric vehicles.

Flash Sintering also enables significant process benefits and enhanced product properties. These capabilities could deliver significant improvements to the electrolyte fabrication process and increase ceramic strength, allowing thickness reduction and lower resistance with benefits for sodium battery performance.

Sodium batteries made by this route could take significant shares of the Electric Vehicle battery market and lead to new manufacturing companies with associated supply chain and thus employment benefits.

Want to find out more about this project?
Contact David Pearmain,
david.pearmain@lucideon.com

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**Developing a technology to deter abuse of drugs**

Opioid medications are prone to abuse (either intentionally or accidentally) by patients, and cost healthcare systems billions of USD$ per year. The FDA (US Food and Drug Administration) is putting increasing pressure on manufacturers to reduce the risk of misuse of these drugs by developing ‘abuse-deterrent formulations’.

At Lucideon, we’ve developed a proprietary iCRT platform, iCRT-deter, for the purpose of producing an abuse deterrent oxycodone formulation that exploits the natural properties of the carrier matrix.

The first challenge to overcome was to enable release of the active compound at the pharmacologically desired rate and to match that of the current market product. By varying the process conditions, it was possible to tune the release profile and reduce the differences when extracting in different solvents. HPLC analysis confirmed that the process conditions do not degrade the drug which can be loaded at the initial stages, ensuring uniform distribution and limiting initial burst release.

The next stage was to produce a biorelevant dosage form. We worked with a partner organization to identify an optimal tablet formulation that retains the release properties of the iCRT-oxycodone powder as developed.

We are now looking to put the iCRT-oxycodone tablets through a suite of rigorous abuse deterrent tests to show that the active ingredient cannot be extracted.

Once successful, we will then partner with a pharmaceutical company, introducing our technology into their product line.
CERAMIC PARK

Have you heard about the proposed Ceramic Park in Stoke-on-Trent, UK, the city where Lucideon has its headquarters?

An international centre for ceramics, the Park will house the National Advanced Sintering Centre (NASC) and the Advanced Materials Research and Innovation Commercialization Centre (AMRICC), both of which are supported by Lucideon. If the bid is successful, Lucideon will also relocate its headquarters to the park.

NASC will bring together 10 of the UK’s Higher Education institutions, alongside industry, to create a hub for sintering R&D, delivering a step change in the research capacity for the development and production of ceramic products that cannot be made by conventional methods.

AMRICC is focussed on translating materials, processes and technologies into real world products and solutions.

AMRICC will also be offering degree apprenticeships in materials, helping to train the next generation of materials scientists and engineers. The content of the degree apprenticeship will include a broad range of materials including metals, ceramics and advanced ceramics, glass, polymers, rubbers and composites, as well as new and novel materials.

Here’s what Tony Kinsella, our Chief Executive, says about the proposed Park:

“Lucideon is committed to the growth of the traditional and advanced ceramics sectors by providing its materials expertise, facilities and pioneering spirit to expedite the journey from research and development to commercial products and processes.

“With world-leading research, pilot plants and commercialization services, coupled with education and training to develop a new generation of commercially-minded scientists and engineers, the Ceramic Park will become the driver of economic growth and attract national and international investment into the city.

“Relocating our business to the Park will allow us to double our workforce, and to develop and support NASC and AMRICC.

“Together, both the NASC facility and AMRICC will lead the way in developing the advanced ceramics technologies of the future which, in turn, will lead to job creation, productivity and innovation improvements and an upskilling of the industry.”
NEW PEOPLE & ROLES

We are delighted to introduce our latest team members who bring with them a wealth of expertise and industry experience.

Marta Fedorciuc-Onisa
Senior Chemist

Marta has recently joined us in the role of Senior Chemist, where she will support technical projects. During her MSc at the University of Bucharest, she studied 'Science and engineering of oxide materials' and has spent the past 17 years analyzing the plant manufacturing process including R&D and QC.

Sherry Ghanizadeh
Technical Consultant

Sherry is a ceramics engineer with an MSc in 'Nanomaterials for Nanoengineering' and a PhD in ‘Synthesis and Processing of Nanostructured Alumina Ceramics’, and has published several research papers on ceramic materials. At Lucideon, Sherry is working on the Flash Sintering of various materials for industrial applications. She is also focusing on establishing an R&D platform to carry out research on Ceramic Matrix Composites (CMCs) and Additive Manufacturing of Ceramics.

Andy Perry
Group Ceramic Processes Leader

Having spent 28 years with Ideal Standard, Andy joins us as the Ceramic Processes Leader for the Group. His role includes helping clients improve process control from raw material to finished product, with a view to reduce processing costs and improve efficiencies, for example, optimizing the recipe and then determining the optimum Rheology associated with that recipe to produce the best results.

Steve Moulton
Materials Technologist

Steve has spent his career in the ceramics industry, where he’s had a variety of technical based roles, predominantly in the ceramic tile sector. At Lucideon, Steve is involved in the Flash Sintering and MIDAR work we do, as well as leading on tile projects.

QUICK UPDATES

MIDAR
A recent project for the development of cement-free building products is progressing at speed with the aim of helping our client to have the first complete products on the market in 2019. www.lucideon.com/midar

iCRT
2 projects for our controlled release technology in the agricultural industry using current active ingredients are providing a platform for Lucideon to develop new material combinations that give unique release profiles required for effective delivery of the active ingredient. www.lucideon.com/icrt-agri

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WHITEPAPERS AND WEBINARS

Don’t forget that we have a number of resources on our website that you can download for free. Examples include:

- The Whys and Whats of Scale-up
- Milling Processes & Techniques
- Drying Processes – The Balance Between Efficiency and Product Quality

To access our resources visit: www.lucideon.com/insight-hub

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Use us as an additional knowledge centre or an extended technical network.

KNOWLEDGE
Stay ahead of the field with our Information Service. With tailored alerts to your inbox, a comprehensive search service and 24/7 access to our World Ceramics Abstracts database, we can help you to source all the ceramics and materials information you need.

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